1903MNRAS..63..132.

number of stars down to magnitude $m + 1$ to the number down to magnitude m, we obtain

$$\left.\begin{array}{l} r^{2\cdot38} = 4\cdot29\ [\log = \cdot632] \text{ from the } 20^{s} \text{ and } 3^{m} \text{ images} \\ r^{5\cdot20} = 29\cdot58\ [\log = 1\cdot471] \text{ from the } 20^{s} \text{ and } 40^{m} \text{ images} \end{array}\right\}$$

$$\left.\begin{array}{l} \text{Thus from the } 20^{s} \text{ and } 3^{m} \text{ images we get } r = 1\cdot84 \\ \text{and from the } 20^{s} \text{ and } 40^{m} \text{ images we get } r = 1\cdot92 \end{array}\right\}$$

These ratios are deduced from the number of stars shown in duplicate.

The variation of the star density with the distance from the Milky Way is distinctly shown, though not in very striking manner by these counts, as the area considered only just reaches the Milky Way at about 0^{h}, and is 50° from it at 12^{h}. The minimum number of stars per square degree, especially for the 40^{m} exposure, is very noticeable from 9^{h} to 15^{h}. Here the distance from the Milky Way lies between 50° to 43°. There is a gradual rise to about three times this number of stars at 5^{h} and 19^{h}, when the centre of the zone considered approaches closely to the Milky Way, and there is a still more pronounced maximum at 22^{h}, which is strikingly shown with all three exposures. Between 19^{h} and 5^{h}, where the zone approaches and just enters the galaxy, there are, as the diagram shows, some irregularities with two maxima and three minima.

Note on the Reproduction and Publication of the Photographs for the Astrographic Chart taken at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

In accordance with the recommendation of the International Committee, it is proposed to reproduce and distribute to a limited number of Observatories and Institutions the Greenwich portion of the Astrographic Chart, the original negatives being enlarged to twice the scale.

After careful trial a method of direct photographic reproduction has been adopted, prints being taken by contact on bromide card (15 in. × 12 in.) from an enlarged positive on glass. By this method it is found that practically no stars are lost in reproduction, and that there is little liability to the introduction of false stars in the process beyond those which may exist in the original negative, and these can readily be detected by reference to the overlapping plate. They are for the

1903MNRAS..63..132.

most part large and round, and can be as readily distinguished with a single image as with a triple image, which for such large stars is practically blended into one.

On full consideration it is believed that sufficient provision will be made for the utilisation of the Astrographic Chart if the reproduction is limited to fifty sets, to be distributed to a selected list of Observatories and Institutions (including the eighteen participating Observatories) where proper provision is likely to be made for the satisfactory storage of the 22,000 sheets of which the chart will consist; an important consideration in view of the bulky nature of the work. It is to be noted that additional sets can be taken subsequently to meet any further demand which may arise.

A careful estimate gives for the cost of reproduction of fifty sets of the 1,149 plates of the Greenwich Zone, including the preparation of two sets of positive enlargements on glass, 3,000*l.*, or at the rate of 60*l.* a set—equivalent to one shilling per print on bromide card 15 in. × 12 in. This is the total cost of labour, plates, paper, and chemicals. It is estimated that two persons working together can complete the fifty sets for the Greenwich Zone (about 2,400 positive enlargements and 60,000 bromide prints, 15 in. × 12 in.) in from five to six years.

The following method has been adopted as the result of experiments on purely photographic lines. From the original chart plate a positive on glass of twice the scale is made in a camera using a lens working at *f*/8 and with a focal length of 11·2 inches. A uniform illumination is obtained by the irregularly reflected light of a white screen, illuminated by electric lamps arranged symmetrically round the plate.

From this positive, prints on glazed bromide paper are made by contact. The paper employed is a thin card, the sheets being 15 inches by 12. This gives a half-inch margin at the sides and about 2 inches at the top and bottom, thus leaving room for the insertion of title and data concerning the plate.

The prints obtained by this process are exact copies of the original, and no retouching is effected to eliminate any defects which might be mistaken for stars. Generally there is no difficulty, but in all cases of doubt reference to the same field on the overlapping plate can be made. Counts were made of the number of stars shown on the original negatives and on the prints for three pairs of overlapping plates, and 1,046 images were found on the prints and 1,060 on the original plates. It thus appears that practically all stars shown on the plates are reproduced on the prints.

1903MNRAS..63..132.

Note on Photographs of Comet d 1902 Giacobini obtained with the 30-inch Reflector at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

Seven photographs of this comet have been obtained with the 30-inch reflector on six nights, with exposures varying from thirty minutes to five minutes. In the case of three photographs the driving of the telescope was corrected to allow for the comet's motion, but the remaining photos were taken with the telescope guided on the stars, the comet's motion in ten minutes being very small. The comet is well shown with an exposure of ten minutes, the photographic image being of stellar character, and capable of very exact measurement.

The following is a list of the photographs obtained up to the present time :—

Date.	Exposure.	Remarks.
1902.		
Dec. 29	30^{m}	Comet's motion in R.A. and Decl. corrected.
,, 30	10^{m}, 15^{m}	Comet's motion in Decl. corrected.
,, 31	10^{m}, $7\frac{1}{2}^{\mathrm{m}}$, 10^{m}, 5^{m}	,, ,,
1903.		
Jan. 2	10^{m}, 10^{m}, 8^{m}	Telescope guided on the stars.
,, 3	10^{m}, 10^{m}, 10^{m}	,, ,,
,, 7	15^{m}	,, ,,
,, 7	15^{m}	,, ,,
,, 8	10^{m}, 10^{m}	,, ,,

Royal Observatory, Greenwich:
1903 *January* 9.

Note on Plate Constants. By F. W. Dyson, M.A., F.R.S.

In a paper by the Astronomer Royal and myself (*Monthly Notices*, vol. lvi. pp. 114–134) the reduction of a number of astrographic plates according to the formulæ and methods given by Professor Turner (*Monthly Notices*, vol. liv.) was considered. It was shown that the constants *a* and *e* computed in this way gave discordances with the values of these constants calculated so as to correct for the scale of the telescope, and for the differential effects of aberration and refraction of a magnitude which might be expected from the errors of the right ascensions and declinations of the reference stars. Similarly the constants *b* and *d*, which are mainly caused by an orientation error of the plate, showed differences of the magnitude which would arise from the errors of the reference stars. It was considered, therefore, that it would be better to use calculated values of *a* and *e*,